

Smithsonian.com

Horrific Tales of Potatoes That Caused Mass Sickness and Even Death

A greened potato indicates the presence of a toxin that can cause gastrointestinal distress, induce coma or even death within 24 hours of consumption



(Shaylyn Esposito)

By [K. Annabelle Smith](#)

[smithsonian.com](#)

October 21, 2013

It was the second day of autumn term at a small boys' school in South London in 1979. Without warning, [78 schoolboys and a handful of monitors simultaneously fell ill](#). Symptoms included vomiting, diarrhea, abdominal pain and, in severe cases, depression of the central nervous system. Several patients were comatose with episodes of convulsive twitching and violent fits of fever. In many patients, there were signs of peripheral circulatory collapse. Within five days of the initial outbreak, all patients recovered in full, though some hallucinated for several days, [Mary McMillan and J.C. Thompson report in the *Quarterly Journal of Medicine*](#). But what could cause such a sudden and mysterious illness?

Turns out, [a bag of potatoes left in storage](#) from the previous summer term.

After careful analysis of the sequence of events, the onset of symptoms was pinpointed to about four to 14 hours after the boys had eaten boiled potatoes that had a high concentration of the toxin, solanine, a glycoalkaloid that was first isolated in 1820 in the berries of a European black nightshade. Nightshade is the term used to describe over 2,800 species of plants in the scientific family, *Solanaceae*. Eggplants, [tomatoes](#), and some berries are common members of the nightshade family—many of them contain highly toxic

alkaloids.

That said, the potato is the most common cause of solanine poisoning in humans. But how do you know when solanine is present in a potato? The tuber is turning green.

Though the green color that forms on the skin of a potato is actually chlorophyll, which isn't toxic at all (it's the plant's response to light exposure), the presence of chlorophyll indicates concentrations of solanine. The nerve toxin is produced in the green part of the potato (the leaves, the stem, and any green spots on the skin). The reason it exists? It's a part of the plant's defense against insects, disease and other predators.

If you eat enough of the green stuff, it can cause vomiting, diarrhea, headaches, paralysis of the central nervous system (as evidenced by the incident above) but in some rare cases the poisoning can cause coma—even death. Studies have recorded illnesses caused by a range of 30 to 50 mg of solanine per 100 grams of potato, but symptoms vary depending on the ratio of body weight of the toxin and the individual's tolerance of the alkaloid. The following cases recorded in various medical journals include examples of some of the most severe cases of solanine poisoning (many of which resulted in death):

1899: After eating cooked potatoes containing 0.24 mg of solanine per gram of potato, [56 German soldiers](#) experienced solanine poisoning. Though all recovered, in a few cases, jaundice and partial paralysis were observed.

1918: In Glasgow, Scotland, 61 people from 18 separate households were affected at once by a bad batch of potatoes. The following day, a five-year-old boy died of strangulation of the bowel following extreme retching and vomiting. According to "[An Investigation of Solanine Poisoning](#)" by S. G. Willimott, PhD, B.Sc. published in 1933, the case was investigated by scientists, R. W. Harris and T. Cockburn, who concluded in their article, "Alleged Poisoning By Potatoes" (1918), that the poisoning was the result of eating potatoes which contained five or six times the amount of solanine found in normal potatoes. Willimott cites this particular occurrence as an example of the toxin's prevalence: "A review of the literature reveals the fact that authentic cases of solanine poisoning are not so rare as authorities appear to believe."

1922: In autumn of this year, [a serious epidemic broke out in Germany](#) which was traced to the abnormal content of solanine in the potato crop.

1925: [Seven members of a family were poisoned by greened potatoes](#). Two of them died. According to reports, symptoms included vomiting, extreme exhaustion, but no convulsions like that of the schoolboys in London. Breathing was rapid and labored until consciousness was lost a few hours before death.

1948: A case of solanine poisoning involving the potato's nightshade relative, the berry, was recorded in the article "A Fatal Case of Solanine Poisoning" published in the [British Medical Journal](#). On August 13 of that year, a 9-year-old girl with a bad habit of snacking on the berries that grew along the railroad tracks by her house was admitted to the hospital with symptoms of vomiting, abdominal pain, and distressed breathing. She died two days later. An autopsy found hemorrhages in the mucosa of stomach and middle section of her small intestine. The stomach contained about one pint of dark brown fluid.

1952: According to the [British Medical Journal](#), solanine poisoning is most common during times of food shortage. In the face of starvation, there have been accounts of large groups eating older potatoes with a higher concentration of the toxin. In North Korea during the war years of 1952-1953, entire communities were forced to eat rotting potatoes. In one area alone, 382 people were affected, of whom 52 were hospitalized and 22 died. The most severe cases died of heart failure within 24 hours of potato consumption. Some of the less severe symptoms included irregular pulses, enlargement of the heart, and blueing lips and ears. Those who displayed these ailments died within 5 or 10 days. Authors John Emsley and Peter Fell explain their book [Was It Something You Ate?: Food Intolerance: What Causes It and How to Avoid It](#). "In

the final stages there were sometimes a state of high excitability with shaking attacks and death was due to respiratory failure.”

1983: [Sixty-one of 109 school children and staff in Alberta, Canada](#), fell ill within five minutes of eating baked potato. Forty-four percent of those affected noted a green tinge and a bitter taste in the potatoes.

Not to worry though, fatal cases of solanine poisoning are very rare these days. Most commercial varieties of potatoes are screened for solanine, but any potato will build up the toxin to dangerous levels if exposed to light or stored improperly. Often, the highest concentrations of solanine are in the peel, just below the surface and in the sprouted “eyes”—things that are typically removed in cooking preparation—though [Warren](#) would argue even boiling water in potato prep dissolves only a little of the alkaloid. [Emsley and Fell continue:](#)

Most people can easily cope with the solanine in the average portion of potato and show no symptoms of poisoning because the body can break it down and rapidly and excrete the products in the urine. But if the level of solanine is as high as 40 mg per 100 g of potato, symptoms include diarrhea...even coma.

The best way to prevent solanine poisoning is to store tubers in a cool, dark place and remove the skin before consumption. A general rule for avoiding illnesses like the ones described above? Green and sprouted? Throw it out.

About K. Annabelle Smith



K. Annabelle Smith is a writer based in Santa Fe, New Mexico who covers a wide variety of topics for Smithsonian.com. Her work also appears in OutsideOnline.com and Esquire.com.

|